

REMARKS

The Office Action dated May 30, 2003, has been reviewed in detail and the application has been amended in the sincere effort to place the same in condition for allowance. Reconsideration of the application and allowance in its amended form are requested based on the following remarks.

Applicants retain the right to pursue broader claims under 35 U.S.C. §120.

Applicants have provided a unique solution with respect to problems regarding a METHOD OF MAKING A HOLOGEN LAMP AND OTHER ANALOGOUS LAMPS AND OBJECTS, AND APPARATUS FOR THE MANUFACTURE THEREOF. Applicants' solution is now claimed in a manner that satisfies the requirements of the Examiner.

New Claims:

Claims 1-39 have been canceled herein, without prejudice, and Claims 40-59 are newly-presented herein. Claims 40-59 will be discussed herein with respect to the prior art which was applied in the Office Action dated May 30, 2003.

Terneu et al. U.S. Patent No. 5,221,352:

Terneu discloses an apparatus for pyrolytically forming a silicon

oxide coating on an upper surface of a moving, hot glass substrate. Terneu shows a method to make a flat glass, not a lamp bulb or other non-flat glass object. In the method of Terneu, a ribbon of glass 1 is floated along a bath of molten metal 2 to a coating station 4. At the coating station 4, coating gas is introduced to the surface of the glass 1. The coating gas contains silane, such as SiH_4 , nitrogen, and oxygen. A coating of SiO_2 is thus formed on the glass 1. Examples 1 and 2 in Terneu disclose that the SiO_2 layer is 90nm or 100nm thick.

In contrast to Terneu, independent Claims 40 and 44 each recite a method of making a halogen lamp. It is respectfully submitted that Claims 40 and 44 distinguish over Terneu, which only shows a method of making flat glass. Claims 41-43 and Claims 45-47 are also believed to distinguish over Terneu based on their dependence from Claims 40 and 44 respectively and their distinguishing features.

Independent Claim 48 recites:

"A method of making a glass object, such as lamp bulbs and lamp bulbs for halogen lamps; ampoules, bottles, vials, cylinder ampoules, pharmaceutical primary packaging, and other containers for medical and pharmaceutical products; reagent containers, test tubes, burets, pipettes, and titration cylinders; tubular parts for chemical equipment construction; and flat glass, by hot forming, said method comprising the steps of:
(a) producing a melt of molten glass;

(b) forming a glass body; and
(c) providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth sufficient to minimize reactivity of the contacted surface portion."

In contrast to Terneu, Claim 48 recites "providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth sufficient to minimize reactivity of the contacted surface portion." Terneu does not teach or suggest such a method step. Claim 49 recites "said step of providing a stream of gas comprises providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth in the range of 150nm to 2000nm." Terneu discloses forming a SiO₂ coating which is at most 100nm thick.

It is respectfully submitted that Claim 48 distinguishes over Terneu. Claims 49-53 are also believed to distinguish over Terneu based on their dependence from Claim 48 and their distinguishing features.

Independent Claim 54 recites:

"A method of making a glass object, such as lamp bulbs

and lamp bulbs for halogen lamps; ampoules, bottles, vials, cylinder ampoules, pharmaceutical primary packaging, and other containers for medical and pharmaceutical products; reagent containers, test tubes, burets, pipettes, and titration cylinders; tubular parts for chemical equipment construction; and flat glass, by hot forming, said method comprising the steps of:

- (a) producing a melt of molten glass;
- (b) forming a glass body; and
- (c) providing a stream of gas consisting of at least one member of the group consisting of: oxygen, nitrogen, inert gases, CO₂, SO₂, and H₂O, to contact a portion of a surface of said glass body having an oxygen content configured to treat the contacted surface portion to a surface depth sufficient to minimize reactivity."

In contrast to Terneu, Claim 54 recites "providing a stream of gas consisting of at least one member of the group consisting of: oxygen, nitrogen, inert gases, CO₂, SO₂, and H₂O, to contact a portion of a surface of said glass body having an oxygen content configured to treat the contacted surface portion to a surface depth sufficient to minimize reactivity." Terneu does not teach or suggest such a method step. Claim 55 recites "said step of providing a stream of gas comprises providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to treat the contacted surface portion to a surface depth in the range of 150nm to 2000nm." Terneu discloses forming a SiO₂ coating which is at most 100nm thick.

It is respectfully submitted that Claim 54 distinguishes over

Terneu. Claims 55-59 are also believed to distinguish over Terneu based on their dependence from Claim 54 and their distinguishing features.

Morrill, Jr. U.S. Patent No. 3,401,028:

Morrill discloses an apparatus for forming glass tubes from molten glass. In general, molten glass is stored in cup 35 and is allowed to flow along conical member 36, inside which is located a compensator 37. During operation, the molten glass flows on the exterior of the conical member 36 while a gas, such as air, is fed through the compensator 37 at a substantially constant pressure to keep the molten glass from contacting the compensator 37. The gas flow is used to form glass tubes of various thicknesses and inside diameters. Morrill does not discuss the manufacture of halogen lamps.

In contrast to Morrill, independent Claims 40 and 44 each recite a method of making a halogen lamp. It is respectfully submitted that Claims 40 and 44 distinguish over Morrill, which only shows a method of making glass tubes. Claims 41-43 and Claims 45-47 are also believed to distinguish over Morrill based on their dependence from Claims 40 and 44 respectively and their distinguishing features.

Independent Claim 48 is recited above. In contrast to Morrill, Claim 48 recites "providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth sufficient to minimize reactivity of the contacted surface portion." Morrill does not teach or suggest such a method step. Claim 49 recites "said step of providing a stream of gas comprises providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth in the range of 150nm to 2000nm." Morrill does not teach or suggest such a method step.

It is respectfully submitted that Claim 48 distinguishes over Morrill. Claims 49-53 are also believed to distinguish over Morrill based on their dependence from Claim 48 and their distinguishing features.

Independent Claim 54 is recited above. In contrast to Morrill, Claim 54 recites "providing a stream of gas consisting of at least one member of the group consisting of: oxygen, nitrogen, inert gases, CO₂, SO₂, and H₂O, to contact a portion of a surface of said glass

body having an oxygen content configured to treat the contacted surface portion to a surface depth sufficient to minimize reactivity." Morrill does not teach or suggest such a method step. Claim 55 recites "said step of providing a stream of gas comprises providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to treat the contacted surface portion to a surface depth in the range of 150nm to 2000nm." Morrill does not teach or suggest such a method step.

It is respectfully submitted that Claim 54 distinguishes over Morrill. Claims 55-59 are also believed to distinguish over Morrill based on their dependence from Claim 54 and their distinguishing features.

Kononko et al. U.S. Patent No. 3,937,623:

Kononko discloses a method for the manufacture of glass tubes. Kononko utilizes guide rolls 1 to draw a bait from a melt of molten glass. The bait initiates upward drawing of a glass tube 10, and "air is supplied inside the tube 10 being formed (along arrow A) to adjust the diameter of the glass tube (a forming air flow)" (Kononko, col. 3, lines 64-66). Once stable operating conditions are attained, "a member 11 adapted for feeding the coolant into the annealing section

is introduced into the tube interior" (Kononko, col. 4, lines 2-4).

Kononko discloses that various gases, such as compressed air, flue gases, and water vapors, may be used as coolant to cool the hot glass and form a glass tube. Kononko does not disclose a method of making a halogen lamp.

In contrast to Kononko, independent Claims 40 and 44 each recite a method of making a halogen lamp. It is respectfully submitted that Claims 40 and 44 distinguish over Kononko, which only shows a method of making glass tubes. Claims 41-43 and Claims 45-47 are also believed to distinguish over Kononko based on their dependence from Claims 40 and 44 respectively and their distinguishing features.

Independent Claim 48 is recited above. In contrast to Kononko, Claim 48 recites "providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth sufficient to minimize reactivity of the contacted surface portion." Kononko does not teach or suggest such a method step. Claim 49 recites "said step of providing a stream of gas comprises providing a stream of gas to contact a portion of a surface of said

glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth in the range of 150nm to 2000nm." Kononko does not teach or suggest such a method step.

It is respectfully submitted that Claim 48 distinguishes over Kononko. Claims 49-53 are also believed to distinguish over Kononko based on their dependence from Claim 48 and their distinguishing features.

Independent Claim 54 is recited above. In contrast to Kononko, Claim 54 recites "providing a stream of gas consisting of at least one member of the group consisting of: oxygen, nitrogen, inert gases, CO₂, SO₂, and H₂O, to contact a portion of a surface of said glass body having an oxygen content configured to treat the contacted surface portion to a surface depth sufficient to minimize reactivity." Kononko does not teach or suggest such a method step. Claim 55 recites "said step of providing a stream of gas comprises providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to treat the contacted surface portion to a surface depth in the range of 150nm to 2000nm." Kononko does not teach or suggest such a method step.

It is respectfully submitted that Claim 54 distinguishes over Kononko. Claims 55-59 are also believed to distinguish over Kononko based on their dependence from Claim 54 and their distinguishing features.

Kononko in view of Bienvenue et al. U.S. Patent No. 4,319,156:

Kononko is discussed above. Bienvenue discloses a vehicle headlight having a dual filament tungsten halogen lamp. In the Office Action dated May 30, 2003, the Examiner stated:

"It would have been obvious to a person of ordinary skill in the art at the time the invention was made to make halogen lamps from the tubes produced by Konoko et al using the finishing steps of Bienvenue et al because the tubes produced by Konoko et al would have been expected to be used in any of a multitude of different undisclosed finishing processes and Bienvenue et al taught that the halogen lamp finishing steps were well known."

Independent Claim 40 recites:

"A method of making a halogen lamp by hot forming, said method comprising the steps of:

- (a) producing a melt of molten glass;
- (b) passing said molten glass along a tool to form a glass body having an interior and an exterior;
- (c) providing a stream of gas in the interior of said glass body having an oxygen content configured to minimize alkali ions on the interior surface of said glass body to a surface depth sufficient to minimize reactivity with halogen gas and thus minimize darkening by tungsten deposition on the interior surface of said halogen lamp during operation of said halogen lamp;
- (d) inserting a filament in said glass body to produce the halogen lamp; and

(e) injecting halogen gas into said glass body to produce a halogen lamp."

In contrast to both Kononko and Bienvenue, Claim 40 recites "providing a stream of gas in the interior of said glass body having an oxygen content configured to minimize alkali ions on the interior surface of said glass body to a surface depth sufficient to minimize reactivity with halogen gas and thus minimize darkening by tungsten deposition on the interior surface of said halogen lamp during operation of said halogen lamp." Neither of these references teaches or suggest such a method step. It is respectfully submitted that Claim 40 distinguishes over both Kononko and Bienvenue, either taken singly or in any reasonable combination thereof. Claim 41 recites "said step of providing a stream of gas comprises providing a stream of gas in the interior of said glass body having an oxygen content configured to minimize alkali ions on the interior surface of said glass body to a surface depth in the range of 150nm to 2000nm." Both Kononko and Bienvenue do not teach or suggest such a method step. Claims 41-43 are also believed to distinguish over Kononko and Bienvenue based on their dependence from Claim 40 and their distinguishing features.

Independent Claim 44 recites:

A method of making a halogen lamp by hot forming, said method comprising the steps of:

- (a) producing a melt of molten glass;
- (b) passing said molten glass along a tool to form a glass body having an interior and an exterior;
- (c) providing a stream of gas in the interior of said glass body having an oxygen content configured to treat a portion of the interior surface of said glass body to a surface depth sufficient to minimize darkening by tungsten deposition on a portion of the interior surface of said halogen lamp during operation of said halogen lamp;
- (d) inserting a filament in said glass body to produce the halogen lamp; and
- (e) injecting halogen gas into said glass body to produce a halogen lamp.

In contrast to both Kononko and Bienvenue, Claim 44 recites "providing a stream of gas in the interior of said glass body having an oxygen content configured to treat a portion of the interior surface of said glass body to a surface depth sufficient to minimize darkening by tungsten deposition on a portion of the interior surface of said halogen lamp during operation of said halogen lamp." Neither of these references teaches or suggest such a method step. It is respectfully submitted that Claim 44 distinguishes over both Kononko and Bienvenue, either taken singly or in any reasonable combination thereof. Claim 45 recites "said step of providing a stream of gas comprises providing a stream of gas in the interior of said glass body having an oxygen content configured to minimize alkali ions on the

interior surface of said glass body to a surface depth in the range of 150nm to 2000nm." Both Kononko and Bienvenue do not teach or suggest such a method step. Claims 45-47 are also believed to distinguish over Kononko and Bienvenue based on their dependence from Claim 44 and their distinguishing features.

Independent Claim 48 is recited above. In contrast to both Kononko and Bienvenue, Claim 48 recites "providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth sufficient to minimize reactivity of the contacted surface portion." Both Kononko and Bienvenue do not teach or suggest such a method step. Claim 49 recites "said step of providing a stream of gas comprises providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to minimize alkali ions on the contacted surface portion to a surface depth in the range of 150nm to 2000nm." Both Kononko and Bienvenue do not teach or suggest such a method step.

It is respectfully submitted that Claim 48 distinguishes over both Kononko and Bienvenue, either taken singly or in any reasonable combination thereof. Claims 49-53 are also believed to distinguish

over Kononko and Bienvenue based on their dependence from Claim 48 and their distinguishing features.

Independent Claim 54 is recited above. In contrast to both Kononko and Bienvenue, Claim 54 recites "providing a stream of gas consisting of at least one member of the group consisting of: oxygen, nitrogen, inert gases, CO₂, SO₂, and H₂O, to contact a portion of a surface of said glass body having an oxygen content configured to treat the contacted surface portion to a surface depth sufficient to minimize reactivity." Both Kononko and Bienvenue do not teach or suggest such a method step. Claim 55 recites "said step of providing a stream of gas comprises providing a stream of gas to contact a portion of a surface of said glass body having an oxygen content configured to treat the contacted surface portion to a surface depth in the range of 150nm to 2000nm." Both Kononko and Bienvenue do not teach or suggest such a method step.

It is respectfully submitted that Claim 54 distinguishes over both Kononko and Bienvenue, either taken singly or in any reasonable combination thereof. Claims 55-59 are also believed to distinguish over both Kononko and Bienvenue based on their dependence from Claim 54 and their distinguishing features.

Art Made of Record:

The prior art made of record and not applied has been carefully reviewed, and it is submitted that it does not, either taken singly or in any reasonable combination with the other prior art of record, defeat the patentability of the present invention or render the present invention obvious. Further, Applicants are in agreement with the Examiner that the prior art made of record and not applied does not appear to be material to the patentability of the claims currently pending in this application.

In view of the above, it is respectfully submitted that this application is in condition for allowance, and early action towards that end is respectfully requested.

Summary and Conclusion:

It is submitted that Applicants have provided a new and unique METHOD OF MAKING A HALOGEN LAMP AND OTHER ANALOGOUS LAMPS AND OBJECTS, AND APPARATUS FOR THE MANUFACTURE THEREOF. It is submitted that the claims are fully distinguishable from the prior art. Therefore, it is requested that a Notice of Allowance be issued at an early date.

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Respectfully submitted,

A handwritten signature in black ink, appearing to read "Nils H. Ljungman". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

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